concerned has played an important part in the development of emotional expression in man.

The remaining essays, which we have no further space to consider, are likewise entertaining, and we therefore recommend the book to all who are interested in the sundry biological theories of which it treats.

GEORGE J. ROMANES

LEGGE'S "BIRDS OF CEYLON"

A History of the Birds of Ceylon. By Capt. Vincent Legge, R.A. Part III., concluding the Work. 4to. (London: Published by the Author, 1880.)

THE ornithologists are certainly active at the present time. We have just recorded the commencement of an important work on the Birds of New Guinea, we have now to notice the conclusion of an excellent volume on the Birds of Ceylon. Capt. Legge's book will, we are sure, be much valued by the numerous European residents in the coffee-districts of the island, who cannot fail to have their attention attracted by the beautiful forms of ornithic life which surround them, and as yet have had no ready means of becoming acquainted with what is known of them. Jerdon, singularly enough, did not include Ceylon in the area of his "Birds of India," and although Blyth, Layard, and Holdsworth have worked long and laboriously on the Ceylonese avifauna, their memoirs on the subject are dispersed about in various serials and other publications, which it is not possible for a coffee-planter to have at his command. A general *résumé* of the Ceylonese ornithology, with full descriptions of all the species, with excellent illustrations of the peculiar forms, and with every necessary detail required for the instruction of the local student and collector, is therefore likely to be a most acceptable piece of work to the resident in the island. At the same time Capt. Legge has produced an elaborate and scientifically exact Monograph of a local Avifauna, which will be received with welcome by naturalists of every class, and is well worthy to take its place on their shelves alongside such works as Dresser's "Birds of Europe" and Buller's "Birds of New Zealand," with which it corresponds in size and character.

As regards the general features of the Ceylonese Ornis Capt. Legge observes that the island, "although it contains none of those remarkable forms which characterise the birds of some of the Malay islands, undoubtedly possesses a rich avifauna; and, considering its geographical area (about five-sixths of Ireland), the number of species is very large. The tropical position of Ceylon, coupled with its location in the path of the monsoon winds and rains, fosters the growth of luxuriant vegetation and verdant forests, which, as a matter of course, teem with all that wonderful insect-life necessary for the sustenance of birds. Hence the large number of resident species inhabiting it; whilst the fact of its being situated at the extreme south of an immense peninsula makes it the finishing point of the stream of waders and water-birds which annually pass down the coast of India. Lastly, the prevalence of a northerly wind at the time of migration of weak-flying warblers brings these little birds in numbers to its shores."

The total number of species of birds included in Capt. Legge's work is 371, of which two have been introduced by man's agency, and about eighteen others are somewhat doubtful. The authentically determined birds of Ceylon may therefore be stated at about 350, of which forty-seven are peculiar to the island; this indicates a very large amount of individuality. The relationship of the Ceylonese Ornis, Capt. Legge tells us, is, as might have been expected from the geographical position of the island and its separation from the mainland merely by a shallow strait, "closer to that of South India than to the avifauna of any other part of the peninsula. Wallace, in his great work on the 'Distribution of Animals,' considers the island of Ceylon and the entire south of India as far north as the Deccan as forming a subdivision of the great 'Oriental Region.' It is however in the hills of the two districts, which possess the important element of a similar rainfall, where we find the nearest affinities both as regards birds and mammals; and this is exemplified by the fact of some of the members of the Brachypodidæ and Turdidæ (families well represented in both districts) being the same in the Nilghiris and in the mountains of Ceylon, while many of the Timaliidæ and Turdidæ in one region have near allies in the other.

"But though this strong similarity in the avifauna of the mountains in question, as well as their geographical characters, indicate a contemporaneous upheaval and enrichment with animal life of their surfaces, a similar connection is found between the northern parts of the island and the low country of the Carnatic.

"Here, again, we have in the fossiliferous limestones of the two regions an undoubted connection, and also an affinity in their avifaunas, which differ totally from that of the mountain-districts on either side of the straits."

In concluding our notice of this admirable volume we must not fail to call special attention to the plates which have been drawn by Mr. Keulemans, and are excellently coloured. They are devoted to the illustration of the species peculiar to Ceylon. Nor must we forget the map, which forms the frontispiece and shows the five zoo-geographical regions into which the author divides the island, besides the various localities referred to in the course of the work.

OUR BOOK SHELF

A Manual of Ancient Geography. Authorised Translation from the German of H. Kiepert, Ph.D. (London: Macmillan and Co., 1881.)

THE name of Kiepert is in itself a sufficient guarantee of the thoroughness and accuracy of a book on geography. That writer, in his "Lehrbuch der Alten Geographie"—from which the present work is abridged, though he himself describes the "Lehrbuch" as a "Werkchen"—has brought together a vast amount of well-digested information respecting ancient geography, so that the book excites the student's admiration from the grasp it displays of the many sides—geological, ethnographical, philological, historical, climatological, &c.—of that wide-reaching subject, and the discernment and critical spirit which characterise it. To the English reader the smaller work, which has been excellently translated by G. A. M., supplies a want that has long been felt. We possess no satisfactory book on the subject intermediate between primers and elaborate treatises, and the present one has all the advantage of being the condensation of a larger book, so that in reading it we feel all through that the

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author draws on a wide field of knowledge. What is most needed in such a manual is that it should be clear, interesting, suggestive, and not overladen with such details as clog the memory while they make no permanent impression on the mind. In the present work the statistical form is avoided, and the dry bones of geography are clothed with such information as gives them life and colour. The vegetation and products of the different countries, their inhabitants and history, are all noticed in connection with the configuration of the ground. Thus of Italy we are told that, "besides the oak forests which covered the lower slopes, and the beeches and firs which covered the higher parts of the mountains up to 5000 feet, and far more densely in ancient times than now, a large part of the mountain region, especially of the Apennines, owing to the steep and rocky character of the ground, remains unsuited for any other purpose but cattle-feeding, and this in the higher regions is confined, as in the Alps, to the summer months. A regular interchange of cattle and sheep according to the seasons, such as is now usual, already went on in antiquity, as, for instance, between Samnium and Apulia." So too, when the volcanic system of Italy is mentioned, we are told that "the lava flowing from these volcanoes afforded in old Roman times, as it does still, the hardest material for binding together the great military roads (*silex*), while the conglomerate of tufa, consisting of the lighter masses thrown down, which was spread over the plain, was the commonest material for building, and its weather-worn surface made the most fertile soil for tillage." In a similar geological sketch of Greece, the various centres of volcanic action are noticed, and the metals which are found in different parts of the country. In respect of the history and politics of the several districts a large amount of useful information is brought together. For instance, we find a clear statement of the names by which the ancient Greeks were known at different times and by different peoples, and the history of the name Italia is discussed in the same manner. Nor are outlying nations neglected. Under the headings "The Scythians" and "The Sarmatae" we get the results of a large amount of research and discussion, and the Carthaginian province in Sicily is duly noticed. Philology again, which is now no unimportant handmaid of geography, is made to add its contribution of information; as when we are told that the names Asia and Europe "are derived from the *açu* and *irib* of the lately-deciphered Assyrian monuments, meaning east and west, and answering to the Homeric expression πρὸς ἠῶ ἠελιόντε and πρὸς ζόφον, to the later Greek names of countries, Ἀνατολή and Ἑσπερία, to the modern *Orient* and *Occident* (borrowed from the Latin), or to the Italian *Levante* and *Ponente.*" Sometimes a name is connected with the features of the ground, as where the Jordan, with its steep descent down a deep valley, is explained to mean "the down-flowing"; or where Zancle is said to be called "the Sickle" from "the form of the tongue of land which incloses the natural harbour." So, too, the student is incited to further research when he learns that Mount Atabyrion in Rhodes bears in reality the same name as Mount Tabor, and that other Greek names have undoubtedly Semitic appellations; and his appetite for history is whetted by discovering that Cappadocia is the Old Persian *Katpatuka*, and that Marsala is the mediæval Arabian name for Lilybæum. Numerous points like these are illustrated by geography, and M. Kiepert gives his readers the full benefit of them. But this is not to the neglect of the more substantial part of the subject, which is amply and clearly expounded. H. F. TOZER

Lehrbuch der organischen qualitativen Analyse. Von Dr. Chr. Th. Barfoed. Dritte Lieferung. (Kopenhagen: Andr. Ferd. Höst und Sohn, 1881.)

DR. BARFOED'S work on organic qualitative analysis is completed by the issue of the present part. The author is to be congratulated on producing so valuable a book of reference for the laboratory worker. The present part contains a full account of the tests for the commoner alkaloids, and for a few of the more fully examined vegetable colouring matters. A general method for the examination of organic substances, whether free from, or mixed with, inorganic compounds, is also given. This general plan is not however arranged in cut-and-dry tabular form, but is rather a guide which in the hands of the experienced student will prove of much value. We can but repeat what we said in noticing the first part of this book, that every student who is desirous of obtaining a real knowledge of qualitative organic analysis, ought to possess Dr. Barfoed's work.

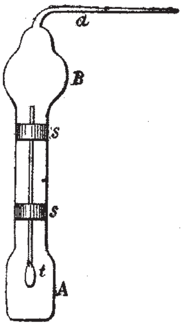
LETTERS TO THE EDITOR

[*The Editor does not hold himself responsible for opinions expressed by his correspondents. Neither can he undertake to return, or to correspond with the writers of, rejected manuscripts. No notice is taken of anonymous communications.*

[*The Editor urgently requests correspondents to keep their letters as short as possible. The pressure on his space is so great that it is impossible otherwise to ensure the appearance even of communications containing interesting and novel facts.*]

Hot Ice

THAT the experiments of Dr. Carnelley on hot ice have excited much interest is not to be wondered at. His statement, however, that ice could be raised to a temperature of 180° without melting was so amazing that many a one could not accept it without repeating the experiments. Soon after the first short notice of Dr. Carnelley appeared in NATURE we took up the matter, but as the method used by Dr. Carnelley seemed to us to be somewhat troublesome, we made use of quite a different method. In the axis of a glass tube A B, 16 mm. in diameter, and 56 c.m. in length was fixed a thermometer *t* by means of two strips *ss* of elastic brass sheet. One of the ends of the tube was 22 mm. in diameter, while the other end had the shape of a bulb, and was drawn out in a narrow tube, *a b*, about 50 c.m. in length. The tube was placed in an inclined position with the end *b* in a glass filled with water that was kept boiling. The bottom of the glass was covered with a layer of mercury. Next the tube was heated by a Bunsen burner; a part of the air was driven out, and, after retiring the burner, the tube was partly filled with the boiling water of the glass. The water in the tube was then boiled, a still greater part of the air escaped, and by removing the burner the tube filled itself nearly entirely. The heating and cooling were repeated three or four times, and in this manner the tube could be filled with the boiling water, not a single air-bubble being left. The end *b* of the narrow tube was now dipped in the mercury, and by heating the tube so much of the water was driven out that the remainder filled the enlarged part A for three-fourths. The tube being now slowly cooled, the mercury rose in the tube *a b*, and it was very easy to seal the tube at *a* with the blowpipe. The water in A was now frozen, and by gently warming with the hand the ice-cylinder was loosened from the tube; by inverting the tube the molten ice was brought into the bulb B, where it was fixed by freezing. This part of the process presents some difficulty. When the heating by the hand was not stopped in time, too much of the ice was converted into water. However, by placing the bulb B in a freezing mixture of snow and salt the melting can be almost instantly arrested. The bulb of the thermometer being in this way surrounded with an ice-cylinder 12 mm. in diameter, the bulb B had only to be placed in the freezing mixture to have the apparatus ready for the appliance of heat. The results of our experiments confirm those of Dr. Carnelley, inasmuch as the ice did not melt, notwithstanding the heating of the tube at A was in one instance so strong that the glass was softened and gave way to the external pressure of the air. They differ, however, as regards the temperature of the ice, which remained generally at −7°. By very strong heating



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